

For this purpose column dW_p has been provided. This column is simply the product of A and the constant .0002. In actual practice it is unnecessary to use both column A and dW_p together, since dW_p may be entered directly by multiplying d_p by twice column Q_{2m} and setting decimal places properly. Three decimal places are sufficient. Column dW_p may then be summed up and the third decimal place dropped. This will give W_p directly (fig. 3).

Column e is provided for cases where specific humidity is not given, but must be computed from vapor pressure, e .

It is not the purpose of this article to discuss the use of the quantity W_p . However, a chart showing the daily distribution of precipitable water from 2 to 5 kilometers over the United States is herein presented for general interest.

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SOLAR OBSERVATIONS

[Meteorological Research Division, EDGAR W. WOOLARD in charge]

SOLAR RADIATION OBSERVATIONS, APRIL, 1939

By IRVING F. HAND

Measurements of solar radiant energy received at the surface of the earth are made at eight stations maintained by the Weather Bureau, and at nine cooperating stations maintained by other institutions. The intensity of the total radiation from sun and sky on a horizontal surface is continuously recorded (from sunrise to sunset) at all these stations by self-registering instruments; pyrheliometric measurements of the intensity of direct solar radiation at normal incidence are made at frequent intervals on clear days at three Weather Bureau stations (Washington, D. C., Madison, Wis., Lincoln, Nebr.) and at the Blue Hill Observatory of Harvard University. Occasional observations of sky polarization are taken at the Weather Bureau stations at Washington and Madison.

The geographic coordinates of the stations, and descriptions of the instrumental equipment, station exposures, and methods of observation, together with summaries of the data, obtained up to the end of 1936, will be found in the *MONTHLY WEATHER REVIEW*, December 1937, pp. 415 to 441; further descriptions of instruments and methods are given in Weather Bureau Circular Q.

Table 1 contains the measurements of the intensity of direct solar radiation at normal incidence, with means and

their departures from normal (means based on less than 3 values are in parenthesis). At Madison and Lincoln the observations are made with the Marvin pyrheliometer; at Washington and Blue Hill they are obtained with a recording thermopile, checked by observations with a Marvin pyrheliometer at Washington and with a Smithsonian silver disk pyrheliometer at Blue Hill. The table also gives vapor pressures at 8 a. m. (75th meridian time) and at noon (local mean solar time).

Table 2 contains the average amounts of radiation received daily on a horizontal surface from both sun and sky during each week, their departures from normal, and the accumulated departures since the beginning of the year. The values at most of the stations are obtained from the records of the Eppley pyrheliometer recording on either a microammeter or a potentiometer.

Direct radiation intensities averaged above normal for April at all Weather Bureau stations.

Total solar and sky radiation was above normal at all stations with the exception of Madison, New York, La Jolla, Miami, Riverside, Ithaca, Newport, Fairbanks, and Blue Hill.

Polarization measurements made on 5 days at Madison give a mean of 55 percent with a maximum of 61 percent on the 30th. Both of these values are close to the corresponding normals for April.